



PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Joseph FERNANDO et al Docket No.: UNF-9058 A
Serial No: 09/560,469 Examiner: HIEN TRAN
Filed: April 28, 2000 Group No.: 1764
For: Support Element For Fragile Structures Such As Catalytic Converters

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APPELLANTS' BRIEF UNDER 37 C.F.R. §1.192

Dear Sir:

This is an appeal to the Board of Patent Appeals and Interferences (the "Board") from the final rejection set forth in the Office Action mailed February 11, 2004. The Notice of Appeal was mailed by Appellants on March 8, 2004, and was received by the USPTO on March 11, 2004. The present appeal is of claims 1-27 and 41-44 of the present application. In accordance with 37 C.F.R. §1.192(a), Appellants' Appeal Brief is submitted herewith in triplicate.

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1. Real Party in Interest

The owner of the present patent application is Unifrax Corporation, by virtue of an assignment from the Appellants. Unifrax Corporation is a for-profit corporation duly organized and existing under and by virtue of the laws of the State of Delaware, United States of America. The assignment for this application was recorded in the records of the Assignment Division of the United States Patent and Trademark Office on August 7, 2000 at Reel/Frame 011041/0408.

2. Related Appeals and Interferences

Neither the Appellants, the Appellants' legal representatives, nor the Assignee are aware of any related appeals or interferences which would directly affect or would be directly affected by, or have a bearing on the Board's decision in the presently pending appeal.

3. Status of Claims

The present application was filed on April 28, 2000 with claims 1-40 inclusive. Claims 41-46 were added by Preliminary Amendment filed on June 5, 2002. A Restriction Requirement for this application was mailed by the USPTO on April 14, 2003. On May 14, 2003, Appellants elected claims 1-27 and 41-44 for prosecution in the present application. Claims 1-27 and 41-44 are currently under final rejection and claims 28-40, 45, and 46 have been withdrawn from consideration. Claims 1-27 and 41-44 constitute the claims on appeal. Claims 1-27 and 41-44 appear in the attached Appendix as required by 37 C.F.R. §1.192(c)(9).

4. Status of Amendments

Claims 22-24 were amended by Appellants' response filed on November 21, 2003. A Final Office Action was mailed by the USPTO on February 11, 2004. No amendments have been made to claims 1-21, 25-27, or 41-44 during the prosecution of the present application. No amendments to pending claims 1-27 and 41-44 have been filed with the USPTO subsequent to the mailing date of the Final Office Action.

5. Summary of the Invention

The invention relates to a device for the treatment of exhaust gases. The device comprises a housing having an inlet at one end and an outlet at an opposite end through which exhaust gases flow, a fragile structure resiliently mounted within said housing, the fragile structure having an outer surface and an inlet end surface at one end in communication with said inlet of said housing and an outlet end surface at an opposite end in communication with said outlet end of said housing, and a support element disposed between the housing and the fragile structure. The support element provides thermal insulation and mechanical support.

The support element comprises an integral, substantially non-expanding ply of melt-formed ceramic fibers containing alumina and silica that been treated by heating the fibers under one of two claimed time-temperature regimens, namely, (i) a time-temperature regimen of heat treating at a temperature of 990°C to at least 1050°C for greater than 1 hour to develop about 5 to about 50 percent crystallinity as detected by x-ray diffraction and a crystallite size of about 50Å to about 500Å, or (ii) at a temperature of greater than 1050°C for an effective amount of time to develop about 5 to about 50 percent crystallinity as detected by x-ray diffraction and a crystallite size of about 50Å to about 500Å. The support element comprising the heat treated fibers is capable of exerting a minimum residual pressure for holding the fragile structure within the housing of at least 4 psi after 200 cycles of testing at 900°C or at least 10 psi after 1000 cycles of testing at 750°C.

6. Issues

The issues of the present appeal are:

A) Whether, under 35 U.S.C. §112, second paragraph, claims 8, 9, and 19-25 particularly point out and distinctly claims the subject matter which Appellants regard as the invention?

B) Whether, under 35 U.S.C. §103(a), claims 1-27 and 41-44 are patentable in view of the combination of USPN 5,580,532, JP 07-286,514, and GB 1,481,133?

7. Grouping of Claims

Claims 1-11, 41 and 42 (“Group I”) stand or fall together with respect to the rejection under 35 U.S.C. §103. Claims 12-27, 43 and 44 (“Group II”) stand or fall together with respect to the rejection under 35 U.S.C. §103. However, Group I and Group II do not stand or fall together with respect to the rejection under 35 U.S.C. §103.

8. Argument

Issue A

Claims 8, 9, and 19-25 have been finally rejected under 35 U.S.C. §112, second paragraph. It has been alleged that claims 8, 9, and 19-25 are indefinite for failing particularly point out and distinctly claim the subject matter which Appellants regard as the invention. Appellants respectfully traverse this rejection.

The primary purpose of 35 U.S.C. §112, second paragraph, is to ensure that the scope of the claims is clear so that the public will have notice as to what constitutes infringement of the patent claims. *United Carbon Co. v. Binney Co.*, 317 U.S. 228 (1942); *Georgia-Pacific Co. v. United States Plywood Corp.*, 258 F.2d 124, 118 USPQ

122 (2d. Cir., 1958); *MPEP* §2173. The test for determining whether the claims are definite under 35 U.S.C. §112, second paragraph, is “whether those skilled in the art would understand what is claimed when the claim is read in light of the specification.” *Union Pacific Resources Co. v. Chesapeake Energy Corp.*, 236 F.3d 684, 57 USPQ2d 1392 (Fed. Cir. 2001); *Orthokinetics, Inc. v. Safety Travel Chairs, Inc.*, 806, F.2d 1565, 1 USPQ2d 1081 (Fed. Cir. 1986). If the claims read in light of the specification reasonably apprise those skilled in the art of the scope of the invention, §112 demands no more. *Miles Lab., Inc. v. Shandon, Inc.*, 997 F.2d 870, 27 USPQ2d 1123 (Fed. Cir. 1993).

Claims 8, 19, 20, and 25 are directed to certain embodiments of the support element of the exhaust gas treatment device having the ability to exert varying minimum residual holding forces. The language of each of these claims is clear and definite and one having skill in the art can easily ascertain the scope of the claims, when read in light of the specification. As one of ordinary skill in the art can easily ascertain the scope of the claims when read in light of the specification, the primary purpose of 35 U.S.C. §112, second paragraph, which is to give fair notice to persons of the scope of the invention, is satisfied. Appellants respectfully submit that the Board reverse the final rejection of claims 8, 19, 20, and 25 under 35 U.S.C. §112, second paragraph.

“A product-by-process claim, which is a product claim that defines the claimed product in terms of the process by which it is made, is proper.” *In re Luck*, 476 F.2d 650, 177 USPQ 523 (CCPA 1973).

Each of claims 9 and 21-24 recite method limitations. Claims 9 and 21 recite method limitations with respect to forming the support element of the exhaust gas treatment device. Specifically, claims 9 and 21 recite the process steps “. . . *spinning* the fibers,” “. . . *heat treating* the fibers,” and “. . . *incorporating* the fibers . . .” Independent claims 1 and 12 are proper product-by-process claims. Claim 9 depends

from claim 1 and claim 21 depends from claim 12. Pursuant to the Patent Office rules, dependent claims 9 and 21, which include process limitations, define the product in terms of the process by which it is produced. Therefore, claims 9 and 21 are proper dependent product-by-process claims. Appellants respectfully request the Board to reverse the final rejection of claims 9 and 21 under 35 U.S.C. §112, second paragraph.

Each of claims 22-24 also recite method limitations. Claims 22-24 recite method limitations with respect to heat treating the fibers of the support mat of the exhaust gas treatment device. As stated above, independent claim 12 is a proper product-by-process claim. Claims 22-24 depend from claim 12. Claims 22-24 include the process steps for “*heat treating*” the fibers of the support element. Pursuant to the Patent Office rules, dependent claims 22-24, which include process limitations, define the product in terms of the process by which it is produced. Therefore, claims 22-24 are proper dependent product-by-process claims. Appellants respectfully request the Board to reverse the final rejection of claims 22-24 under 35 U.S.C. §112, second paragraph.

Appellants respectfully submit that claims 8, 9, and 19-25 are proper product-by-process claims. Claims 8, 9, and 19-25 are definite and particularly point out and distinctly claim the subject matter which Appellants regard as their invention. Accordingly, Appellants respectfully request the Board to reverse the final rejection of claims 8, 9, and 19-25.

Issue B

Claims 1-27 and 41-44 have been finally rejected under 35 U.S.C. §103 over United State Patent No. 5,580,532 (“US ‘532”), in view of JP 07-286,514 (“JP ‘514”) and GB 1,481,133 (“GB ‘133”).

The following allegations have been made by the Examiner under 35 U.S.C. §103(a):

- that US '532 discloses a device comprising a housing, a fragile structure mounted in the housing, and a non-expanding support element of ceramic fibers containing alumina and silica disposed between the housing and the fragile structure;
- that JP '514 discloses a ceramic fiber mat disposed between a catalyst and a housing in which the ceramic fibers have been heat treated at a temperature of 1300°C for 4 hours to produce a crystallinity of 0-10% crystallinity;
- that GB '133 discloses to heat treat fibers at 950°C to 1050°C from 10 minutes to 1 hour to produce fibers having a crystallite size of less than 200Å.
- that it would have been obvious to one having ordinary skill in the art to heat treat the ceramic fibers of US '532 to form fibers having a percent crystallinity as allegedly disclosed by JP '514 and the crystallite size as allegedly disclosed by GB '133.

Appellants respectfully traverse this rejection. To establish a *prima facie* case of obviousness of a claimed invention, all of the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). To establish a *prima facie* case of obviousness, there must be some suggestion or motivation to modify a reference or to combine reference teachings, there must be a reasonable expectation of success, and the prior art must teach or suggest all claim limitations. *MPEP* §2142. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior

art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16USPQ2d 1430 (Fed. Cir. 1990).

The presently claimed support element comprises an integral, substantially non-expanding ply of melt-formed ceramic fibers containing alumina and silica. In one embodiment, the fibers of the support element are prepared by heat treating the fibers under a time-temperature regimen of heat treating at 990°C to at least 1050°C for *greater* than 1 hour such that the fibers have about 5 to about 50 percent crystallinity as detected by x-ray diffraction, and a crystallite size of about 50Å to about 500Å. In another embodiment, the fibers are heat treated under a time-temperature regimen of heat treating at a temperature of *greater* than 1050°C for an effective amount of time such that the fibers have about 5 to about 50 percent crystallinity as detected by x-ray diffraction, and a crystallite size of about 50Å to about 500Å.

US '532

US '532 discloses an exhaust gas treatment device comprising a housing, a fragile structure mounted in the housing, and a support element of ceramic fibers disposed between the housing and the fragile structure. The Final Office Action expressly concedes, and Appellants agree, that US '532 "is silent" with respect to the step of heat treating the fibers of the support element to develop a desired crystallinity and crystallite size. US '532 is also "silent" with respect to the crystallinity and crystallite size of the fibers. Appellants further assert that US '532 does not provide any teaching, suggestion, or motivation to heat treat the ceramic fibers under any time-temperature regimen for the purposes of developing a desired crystallinity and crystallite size.

JP '514

JP '514 discloses a catalyst holder for an exhaust gas treatment device. The holder comprises a blanket of alumina fibers of mullite composition.

GB '133

GB '133 discloses only one time-temperature regimen for heat treating ceramic fibers, namely, heat treating ceramic fibers in a temperature range of 950°C to 1050°C for 10 minutes to 1 hour. GB '133 clearly and unequivocally teaches that "...the use of an excessive temperature above the devitrification temperature, or use of a sufficient devitrification temperature held for an excessive period of time, will tend to produce a coarse-grained structure with poor handling properties." See page 2, lines 97-101. Furthermore, GB '133 expressly and unequivocally teaches to quickly terminate the heating subsequent to formation of the crystalline product, but prior to the onset of excessive grain growth. See page 1, lines 83-92. Moreover, GB '133 teaches that coarse-grained fibers, formed by excessive heat treatment, will exhibit poor handling properties. See page 1, lines 83-92.

As set forth above, US '532 does not disclose, suggest, or provide motivation to heat treat ceramic fibers of the support element under any time-temperature regimen. In contrast to the GB '133, the support element of the present invention discloses two separate and distinct time-temperature regimens for heat treating ceramic fibers, namely, heat treating at a temperature of about 990°C to at least 1050°C for *greater* than 1 hour (claim 1), or heat treating at a temperature of *greater* than 1050°C for an effective amount of time such that the fibers have about 5 to about 50 percent crystallinity as detected by x-ray diffraction, and a crystallite size of about 50Å to about 500Å (claim 12). The time-temperature regimen of claim 1 is outside GB '133, as GB '133 is strictly limited to a heating time period 10 minutes to 1 hour. The time-temperature

regimen of claim 12 is also outside of the time-temperature regimen of GB '133, GB '133 is strictly limited to a heating temperature of 950°C to 1050°C.

With respect to the heating temperature for the fibers, the Examiner has alleged that GB' 133 teaches to heat treat fibers to a temperature of "about 1050°C," and that the term "about 1050°C" includes "1050.1°C." Appellants disagree. GB' 133 teaches away from heat treating ceramic fibers at temperatures above 1050°C, in that it expressly teaches to terminate heat treating at 1050°C and that heat treating the fibers above 1050°C produces deleterious properties in the fiber. Thus, by its express teachings, the heating temperature of GB' 133 is specifically limited to heat treating of ceramic fibers to 1050°C. There is simply no suggestion or motivation in GB '133 to heat treat fibers above 1050°C.

JP '514 does not teach, suggest or provide motivation to heat treat ceramic fibers under a time-temperature regimen of (i) heat treating said fibers at a temperature of at least 990°C to less than about 1100°C for greater than one hour, such that the fibers have at least about 5 to about 50 percent crystallinity as detected by x-ray diffraction, and have a crystallite size of from about 50Å to about 500Å, or (ii) heat treating said fibers at a temperature of at least about 1100°C for a time effective to develop said crystallinity and said crystallite size.

In contrast, JP '514 merely discloses that the crystallinity of the mullite composition alumina fibers used in its catalyst "holder" are compared to the crystallinity of a completely crystallized mullite fiber, which was prepared by calcining at 1300°C for 4 hours. JP '514 states "[H]ere, crystallinity is expressed by a percentage (%) of peak intensity of a mullite composition alumina at $2\theta=26.3^\circ$ in relation to the peak intensity at $2\theta=26.3^\circ$, measured by X-ray diffraction using CuK α -ray, of a completely crystallized mullite, which is sintered at 1300°C for 4 hours." This completely crystallized fiber is a reference fiber to which the mullite composition alumina fiber is compared, and is not the mullite composition alumina fibers incorporated into the catalyst "holder" of JP '514.

Only one other time-temperature regimen is disclosed in JP '514 for heat treating the fibers, namely, heat treating at 800°C for 24 hours. However, the temperature of 800°C is well below the devitrification temperature of alumina-silicate ceramic fibers. The temperature of 800°C is also well outside of both time-temperature regimens of the present invention. JP '514 does not disclose or suggest any other time-temperature regimens for heat treating fibers.

The Final Office Action alleges that the present claims are product-by-process claims and, therefore, the relevant inquiry is whether the product itself is patentable over the prior art. Appellants do not dispute this position, but respectfully submit that they have met their burden of providing evidence that the prior art products do not expressly or inherently possess the characteristics of the present claimed product. Appellants claimed product includes limitations as to crystallinity, crystallite size, and holding force of the support element.

To support Appellants' position that their presently claimed product possesses novel and non-obvious differences relative to the prior art product, Appellants have provided the Examiner with results of comparative testing between the presently claimed product and the prior art product. Appellants have surprisingly discovered that heat treating ceramic fibers at the devitrification temperature of the fiber for periods of time in excess of the time taught by the GB '133, preferably greater than 1 hour, or heating the fibers at a temperature well above the devitrification temperature of the fibers results in the formation of a fiber structure that unexpectedly has excellent mechanical and handling properties, and that is capable of exerting a minimum holding pressure of 4 psi. This finding is in direct contravention of the teachings and disclosure of GB '133.

It should be noted that it was surprising and unexpected, in view of the teachings of GB '133, that heat treating ceramic fibers for excessive periods of time at the devitrification temperature or heat treating the ceramic fibers at a temperature substantially above the temperature taught by GB '133 would result in a fiber having excellent

mechanical and handling properties and having the ability to exert a minimum holding pressure of at least 4 psi. Appellants assert that heat treating ceramic fibers at time-temperature regimens outside of that disclosed by GB '133 produces fibers that exhibit good mechanical properties and increased holding pressures and, therefore, the time-temperature ranges disclosed in the present invention are not obvious in view of the prior art.

Appellants also submit that there is no teaching or disclosure that the fibers of GB '133 exert any minimum holding pressure, or are suitable for use as mounting mats in catalytic converters. Furthermore, there is no teaching or suggestion that heat treating ceramic outside the time-temperature regimen disclosed by GB '133 would produce a ceramic fiber having good mechanical properties and the ability to exert a holding pressure of at least 4 psi. Appellants assert that GB '133 clearly teaches away from heating fibers at any time or temperature outside of the range disclosed. Furthermore, there is no teaching in GB '133 that the fibers disclosed therein would be useful in mounting mats of catalytic converters.

In the Final Office Action, it was alleged that the comparative testing reported in Table I of the present application is not persuasive to show unexpected results. Appellants disagree with the characterization of the comparative testing. Inventive examples 1-10 were compared to Comparative examples A-D. Comparative examples C and D were melt-formed alumino-silicate fiber blankets that were heat treated in accordance with the teachings of GB '133, namely, at a temperature of 1050°C for 30 minutes or 1 hour. Inventive examples 4-10 are also melt-formed alumino-silicate fiber blankets, but that were heat treated in accordance with the time-temperature regimens of the present invention. The results of this comparative testing demonstrates that alumino-silicate fibers can be heat treated outside of the time-temperature regimen disclosed by GB '133; that is, the fibers can be heat treated well above 1050°C or for periods of time much longer than 1 hour. This is in direct contravention to the

teachings of GB '133. Appellants urge the Board not to dismiss the importance of the results of the comparative testing reported by Appellants.

Even if the teachings of JP '514 and GB '133 were combined, the presently claimed time-temperature regimens would not be disclosed. If the presently claimed time-temperature regimens are not disclosed by the combination of JP '514 and GB '133, then the prior art product allegedly taught by this combination would not expressly or inherently possess the same characteristics as the presently claimed support element.

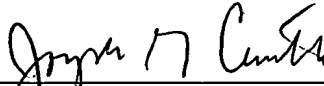
In view of the remarks presented hereinabove, Appellants respectfully request the Board to withdraw the 35 U.S.C. §112 and 35 U.S.C. §103(a) rejections. Appellants further respectfully request the Board to reverse the Final Office Action in this case and to require the Examiner to issue a formal Notice of Allowability for claims 1-27 and 41-44.

Extension of Time

Appellants have enclosed herewith a Petition for a One Month Extension of Time in which to file their Appeal Brief under 37 C.F.R. §1.136(a). Appellants have also enclosed a check in the amount of \$110.00 in payment of the fee for the Petition for a One Month Extension of Time. 37 C.F.R. 1.17(a)(1). In the event an additional fee is applicable to the filing of this document and the required fee is not enclosed, or the fee submitted is insufficient, the Director is hereby authorized to charge any fees which might be required to effect the filing of this document to Deposit Account No. 18-0987.

Should the Board have any questions, Appellants' undersigned attorney would welcome a telephone call.

Respectfully submitted,



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June 10, 2004
Date

9. Appendix

The claims on appeal are as follows:

1. (Original) A device for the treatment of exhaust gases comprising:
 - a housing having an inlet at one end and an outlet at an opposite end through which exhaust gases flow;
 - a fragile structure resiliently mounted within said housing, said fragile structure having an outer surface and an inlet end surface at one end in communication with said inlet of said housing and an outlet end surface at an opposite end in communication with said outlet end of said housing;
 - a support element disposed between the housing and the fragile structure, said support element comprising an integral, substantially non-expanding ply of melt-formed ceramic fibers containing alumina and silica, said fibers having been prepared by a process including heat treating said fibers under a time-temperature regimen comprising heat treating said fibers at a temperature of 990°C to at least 1050°C for greater than 1 hour such that the treated fibers have about 5 to about 50 percent crystallinity as detected by x-ray diffraction, and a crystallite size of about 50Å to about 500Å; and
 - wherein said support element exerts a minimum residual pressure for holding said fragile structure within said housing of one of at least 4 psi after 200 cycles of testing at 900°C or at least 10 psi after 1000 cycles of testing at 750°C.

2. (Original) The exhaust gas treatment device of claim 1, wherein the fragile structure has a perimeter, at least a portion of which is integrally wrapped by the support element.
3. (Original) The exhaust gas treatment device of claim 1, wherein the ceramic fibers are aluminosilicate fibers.
4. (Original) The exhaust gas treatment device of claim 3, wherein the fibers are aluminosilicate comprising about 40 weight percent to about 60 weight percent alumina and about 60 weight percent to about 40 weight percent silica.
5. (Original) The exhaust gas treatment device of claim 1, wherein the fibers have average diameters ranging from about 1 microns to about 14 microns.
6. (Original) The exhaust gas treatment device of claim 5, wherein the fibers have average diameters ranging from about 3 microns to about 6.5 microns.
7. (Original) The exhaust gas treatment device of claim 1, wherein the fibers have less than about 10% shot.

8. (Original) The exhaust gas treatment device of claim 1, wherein the support element provides a minimum residual pressure for holding the fragile structure within the housing after 200 cycles of testing at 900°C of at least 10 psi.
9. (Original) The exhaust gas treatment device of claim 1, wherein the support element is prepared by the process comprising melt spinning the fibers; heat treating the fibers; and incorporating the fibers into mat form.
10. (Original) The exhaust gas treatment device of claim 1, wherein said exhaust gas treatment device is a catalytic converter.
11. (Original) The exhaust gas treatment device of claim 1, wherein said exhaust gas treatment device is a diesel particulate trap.
12. (Original) A device for the treatment of exhaust gases comprising:
- a housing having an inlet at one end and an outlet at an opposite end through which exhaust gases flow;
 - a fragile structure resiliently mounted within said housing, said fragile structure having an outer surface and an inlet end surface at one end in communication with said inlet of said housing and an outlet end surface at an opposite end in communication with said outlet end of said housing;
 - a support element disposed between the housing and the fragile structure, said support element comprising an integral, substantially non-expanding ply of

melt-formed ceramic fibers containing alumina and silica, said fibers having been prepared by a process of heat treating said fibers under a time-temperature regimen comprising heat treating said fibers at a temperature of greater than 1050°C for an effective amount of time such that the treated fibers have about 5 to about 50 percent crystallinity as detected by x-ray diffraction, and a crystallite size of about 50Å to about 500Å;

wherein said support element exerts a minimum residual pressure for holding said fragile structure within said housing of one of at least 4 psi after 200 cycles of testing at 900°C or at least 10 psi after 1000 cycles of testing at 750°C.

13. (Original) The exhaust gas treatment device of claim 12, wherein the fragile structure has a perimeter, at least a portion of which is integrally wrapped by the support element.

14. (Original) The exhaust gas treatment device of claim 12, wherein the ceramic fibers are aluminosilicate fibers.

15. (Original) The exhaust gas treatment device of claim 14, wherein the fibers are aluminosilicate comprising about 40 weight percent to about 60 weight percent alumina and about 60 weight percent to about 40 weight percent silica.

16. (Original) The exhaust gas treatment device of claim 12, wherein the fibers have average diameters ranging from about 1 microns to about 14 microns.
17. (Original) The exhaust gas treatment device of claim 16, wherein the fibers have average diameters ranging from about 3 microns to about 6.5 microns.
18. (Original) The exhaust gas treatment device of claim 12, wherein the fibers have less than about 10% shot.
19. (Original) The exhaust gas treatment device of claim 12, wherein the support element provides a minimum residual pressure for holding the fragile structure within the housing after 200 cycles of testing at 900°C of at least 10 psi.
20. (Original) The exhaust gas treatment device of claim 12, wherein the support element provides a minimum residual pressure for holding the fragile structure within the housing after 1000 cycles of testing at 750°C of at least 10 psi.
21. (Original) The exhaust gas treatment device of claim 12, wherein the support element is prepared by the process comprising melt spinning the fibers; heat treating the fibers; and incorporating the fibers into mat form.

22. (Previously Presented) The exhaust gas treatment device of claim 12, wherein the fibers are heat treated under a time-temperature regimen of heat treating at a temperature between 1100°C and about 1400°C for at least 1 hour.

23. (Previously Presented) The exhaust gas treatment device of claim 12, wherein the fibers are heat treated under a time-temperature regimen of heat treating at a temperature of at least 1100°C for at least 2 hours.

24. (Previously Presented) The exhaust gas treatment device of claim 12, wherein the fibers are heat treated under a time-temperature regimen of heat treating at a temperature of at least 1200°C for at least 10 minutes.

25. (Original) The exhaust gas treatment device of claim 22, wherein the support element provides a minimum residual pressure for holding the fragile structure within the housing after 1000 cycles of testing at 750°C of at least 20 psi.

26. (Original) The exhaust gas treatment device of claim 12, wherein said exhaust gas treatment device is a catalytic converter.

27. (Original) The exhaust gas treatment device of claim 12, wherein said exhaust gas treatment device is a diesel particulate trap.

28. (Withdrawn)

29. (Withdrawn)

30. (Withdrawn)

31. (Withdrawn)

32. (Withdrawn)

33. (Withdrawn)

34. (Withdrawn)

35. (Withdrawn)

36. (Withdrawn)

37. (Withdrawn)

38. (Withdrawn)

39. (Withdrawn)

40. (Withdrawn)

41. (Previously Presented) The exhaust gas treatment device of claim 1, wherein said support element is needed.

42. (Previously Presented) The exhaust gas treatment device of claim 9, wherein said mat is needed.

43. (Previously Presented) The exhaust gas treatment device of claim 12, wherein said support element is needed.

44. (Previously Presented) The exhaust gas treatment device of claim 21, wherein said mat is needed.

45. (Withdrawn)

46. (Withdrawn)